GIZMOS AND GADGETS:

A GUIDEBOOK OF TECHNOLOGICAL RESOURCES

IN THE ELEMENTARY CLASSROOM

By

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Abstract

This research examines the implementation of technology in elementary classrooms. Prior research has shown that elementary teachers have more positive perspectives towards technology incorporation when sufficiently trained through pre-service teacher preparation programs and professional development opportunities for existing educators. Adequate technology instruction is necessary because it teaches educators about available resources and how to appropriately and meaningfully incorporate them into their lessons. Teachers need to provide relevant, authentic learning experiences for their students, teaching them how to function in a technological society. Technology has the potential to increase engagement and academic performance. It also allows teachers to create an accessible classroom environment for all students, including individuals with disabilities. There are numerous methods for technology integration including computer programs, iPad applications, games, virtual experiences, and interactive devices. However, teachers may not be aware of all the resources available. By increasing awareness of these technological resources, teachers can address the diverse learning styles of their students, helping them understand the academic content and preparing them for life outside of the classroom.

Keywords: technology, elementary education, Bloom's Taxonomy, SAMR Model

Introduction

The purpose of this project was to explore effective ways for teachers to incorporate technology in elementary classrooms ranging from 4th to 6th grade. In this project, I decided to investigate the use of technology resources and discover ways to meaningfully incorporate these activities to improve student learning. These programs included computer websites, iPad apps, and other opportunities for technology. The final product of my project is an online guidebook for teachers, who often feel overwhelmed with the abundant amount of technological resources presented to them. This online guidebook should help ease the constant stress that teachers face. It also gives a brief overview of how the program can be used to enhance their students' learning environment.

Every day, teachers are faced with the difficult task of creating engaging lessons for their students and preparing them for their lives both inside and outside of the classroom. In today's society, technology is constantly changing. It has evolved significantly over time and is becoming a prevalent part of our everyday lives. Students almost know more about these current devices than their teachers do. Teachers often feel overwhelmed by the amount of technological resources available, and sometimes they wonder if taking the time to learn about a new program will actually benefit their students in the end. In my guidebook, I investigate available technological resources and describe key features of each program. Teachers can use this information to determine if the resource is appropriate for their classroom. My guidebook also identifies or shows examples of ways to incorporate the technology into one's teaching. The research questions of this project revolve around the subject of technology integration. These questions investigate how teachers implement technology in their classroom, what challenges

teachers face, and what the benefits are of incorporating these technological programs. This resource will provide meaningful learning experiences for students and give teachers a better understanding of available resources.

Rationale

Each day, it seems that there is a new device, app, or program created, and it is hard to keep up with the changing technology. In 2016, I began my first year of teaching. I was hired to teach 6th grade English/Language Arts at Nelson Ridge School in New Lenox, Illinois. Before the school year started, I felt very prepared and ready to take on the new year. My graduate classes well-prepared me for the busy life of an educator. I felt confident in teaching the academic curriculum and balancing lesson-planning with grading assignments. I knew that it was my responsibility to create engaging lessons and prepare my students for their lives both inside and outside of the classroom.

The beginning of the school year was overwhelming: preparing my classroom, learning the curriculum, and developing a consistent routine. Our district strongly encouraged technology use and provided each classroom with a set of iPads. We also had access to computers when needed. I was very excited to hear this. I had never owned an iPad before, but I figured it wouldn't be too difficult to incorporate these features. To ensure that I was creating efficient lessons with these devices, I attended numerous professional development sessions available for staff members. I thought this would expand my confidence with the new technology integration. However, the more sessions I attended, the more upset I became. I was shocked with what I had learned. There were so many technology resources available that I had never even heard of before. Where did all of these programs come from? These certainly weren't available when I was in school. When would I have time to explore these resources? Are some of these programs even worth spending time to explore? I returned back to my classroom and began to look at one of the classroom iPads. Sure enough, there were pages and pages of apps available on this

device. I felt very overwhelmed and defeated. I had been working so hard to master my lesson planning, but I began to question myself. Am I not providing my students with as efficient instruction as I once thought? I decided that something needed to be done about this, not just for my sake but for the sake of other teachers and students as well. I couldn't be the only person who felt this way. As I started talking to other educators, I began to learn that I was not alone. They also did not feel as comfortable or knowledgeable about technology as they would like to be. This inspired me to create a guidebook. I wanted this guidebook to give teachers a better understanding about the resources available, allowing them to modernize their classrooms and simplify their search for technological resources. I hoped to build their confidence in their abilities to provide technologically current, purposeful, and engaging lessons.

Technology can be used throughout a student's learning experience. It may increase engagement in the content and provide hands-on opportunities to practice or demonstrate what they have learned. Through self-directed learning, technology expands student knowledge, encourages informed questions, and sharpens critical thinking. These resources provide flexibility in student learning, addressing the unique learning needs of every student. Technology's growth supports all learning styles by using visual, auditory, graphic, and digital representations of information to strengthen content understanding (Cuff, 2014, p.77-80). To maximize learning opportunities, teachers must provide authentic experiences that include real-life components. Authentic learning experiences simulate real-world scenarios and engage students because they are relevant, complex, and incorporate multiple perspectives and interdisciplinary connections (Hills, 2017, p.9). These experiences allow all students to actively participate in their learning, understand their connection to the material, and develop a more authentic view of the world. The use of technological strategies can give students a better

understanding of the material. The skills and knowledge acquired during these activities prepare students for life outside of the classroom. It teaches them to actively question and explore occurrences in society, take responsibility for their own learning, and become active members in their communities. Technology can play a key role in expanding learning possibilities for students, teachers, and educational professionals.

Literature Review

Effective technology integration utilizes technological tools to enhance teaching, learning, and higher-level thinking skills (Polly & Rock, 2016, p. 336). This technology integration helps students understand that they live in a technological society and improves their abilities in asking questions, debating ideas, making predictions, analyzing data, drawing conclusions, and communicating their findings with peers (Wen et al., 2012, p.228). The subject of technology is sometimes emphasized but often deficient in teacher education. Therefore, students do not recognize its significance because it is not featured in the classroom. According to an investigation by the Technology Delegation in 2010, ninth-graders do not recognize the connection between technology in school and their future higher education and career (Hallström, Hultén, & Lövheim, 2013). They recognize that technology exists, but they do not identify the significance of those same activities or tools in their everyday lives. In a separate study, teachers indicated that their students loved working with smart phones, iPods, iPads, computers, and networked devices of all kinds. However, simple access to this networked technology does not make students better learners (Loertscher & Koechlin, 2012). Instead of focusing on the basic functions of technological resources, instructors should focus on why that technology would be beneficial to their students' learning.

Since technology has become increasingly prevalent in today's society, current educational practices need to prepare students and teachers to thrive in this constantly changing technological society. Teacher preparation programs and professional development opportunities should include extensive training to improve the perspectives of both pre-service and current educators. This guidance can enhance their levels of comfort with the integration of new resources. When educators feel knowledgeable about a resource, they are more likely to

provide meaningful learning experiences for their students. Trainings should emphasize how the combination of technological tools with learning principles, such as the SAMR Model and Bloom's Taxonomy, can enrich students' critical thinking and problem-solving skills. Technology can play a positive role in student learning and academic performances, addressing their unique learning needs, increasing engagement through authentic learning experiences, and allowing students to develop confidence and higher levels of thinking.

Teacher Preparation Programs and Perspectives

In today's classrooms, there are mixed emotions about technology. Educators recognize that technology provides diverse functions, such as collaboration, idea development, word processing, multimedia presentations, and internet exploration (Judson, 2010, p.282). It can also lead to growth in academic learning and engagement. However, teachers may lack experience with integrating technology into teaching, identifying the need for more training in the area. Despite the increase of technology access in schools, pre-service teachers still need instruction on how to plan, design, and integrate these activities into their classrooms (Polly & Rock, 2016, p. 336). One 2014 study in New Zealand examined the results of a particular learning activity with pre-service teachers. Students were asked to investigate a current educational issue and present a docudrama with their findings. This study evaluated the design, development, and implementation of that activity to address particular needs of pre-service teachers. Results from the survey indicate that pre-service teachers found "the use of technology either 'effective' (E) or 'highly effective' (HE) at facilitating a learning environment that: encouraged collaboration (E=42%, HE=50%), encouraged knowledge construction (E= 58%, HE=42%) or challenged them (E=42%, HE=58%). 72% of the students reported that they were 'highly engaged' in the

activity while the remaining students were 'moderately engaged" (Rawlins & Kehrwald, 2014, p.214). After the project, participants expressed more confidence in their technology understanding and their increased enjoyment in cooperative learning. Their positive perceptions towards technology and collaboration can lead to integration of similar activities in their own classrooms and improved student learning. To address the issues with confidence and understanding, teacher preparation programs need to train pre-service teachers how to teach with technology, identifying how to incorporate meaningful activities that reinforce essential subject areas. Pre-service teachers need skills-based courses, integration of technology into methods courses, and technology-rich field placements when preparing for classroom technology integration. Educational technology courses offered in educational programs are typically disconnected from methods courses because they are more focused on technology skills rather than how technology should be used to improve teaching and learning (Sun et al., 2017, p.598). Instead, these experiences should include opportunities with new tools, active social learning situations, and technology-enhanced teaching (Rawlins & Kehrwald, 2014, p.215). Educators require exposure to new pedagogical approaches so that they can critically analyze their technology use and establish the best approach for their students (Greer et al., 2017, p.491). Meaningful technology exposure will show students the relevancy of these tools in their academic curriculum and their daily lives (Van Loo, 2012, p.16).

In addition, teacher beliefs play a significant role in their pedagogical decisions. Teachers may have existing beliefs regarding technology, established classroom practices, or reluctance to change, acting as barriers to their technology integration. They may be hesitant to embrace technology and evolve their beliefs due to attitude, anxiety, self-efficacy, time commitments, or their views on technological competency and relevancy (Fuegen, 2012, p.52).

Their perceptions regarding the use of technology may affect how they involve technology integration in the classroom. Prior technology exposure or training in the educator's life can impact their belief formation and instructional decisions (Er & Kim, 2017, p.1042). In today's school districts, there is more of a focus on acquiring technology instead of training content literacy teachers to use these resources as a meaningful teaching tool. Trainings tend to only focus on how to use a particular device instead of providing strategies to meaningfully meet curriculum goals (Ciampa, 2016, p.295). The full potential of technology integration may not be achieved due to limited educator understanding and guidance. One study uses the Episode-Centered Belief Change Model (ECBC) to evaluate teachers' beliefs about technology based on prior exposure or personal memories. The ECBC Model uses episodic memories to change beliefs regarding technology integration. In this study's findings, teachers expressed that some technologies could only be used in limited ways, such as PowerPoint for whole-group lectures. Others pointed out that teacher-centered approaches were sufficient and effective ways to integrate technology. All participants acknowledged the effectiveness of technology as useful tools for teaching, learning, active engagement, and collaboration. However, they lacked an understanding about the extent of its functions and their role for implementing authentic lessons (Er & Kim, 2017, p.1057). It can be difficult for teachers to incorporate a new teaching tool and philosophy when only a few of them have learned how to apply it (Chanlin, 2007). Therefore, teachers require support when determining how to use technology to support and enhance learning (Loertscher & Koechlin, 2012). Professional development opportunities for current educators should include prior experiences or existing beliefs, encouragement for educators to become more openminded, opportunities to address their concerns through personalized activities and group collaboration (Er & Kim, 2017, p.1060). Both future and current educators

need guidance to learn what productive technologies are available, how to use these resources, and how students will benefit from the integration (Pandya & Avila, 2017, p.128).

In order for teachers to meaningfully incorporate technology, teachers need the necessary skills, attitude, flexibility, effort on systematic planning, and training in curricular design and implementation methods. One key method to improve teacher technology use is to ensure their pre-service preparation is embedded with technology training within methods courses. Current teachers should also have access to professional development and time for technology exploration. This time should give teachers opportunities to collaborate with peers, explore available resources, and discuss how to meaningfully incorporate the tools into their lessons. Collaboration allows teachers to support each other and overcome common challenges, such as low confidence or content familiarity (Hills, 2017, p.8). Teachers can share their findings and resources with one another to reduce the amount of time and stress of exploring new programs. To develop metacognitive skills, students need a teacher that is knowledgeable and open-minded in lesson planning. Their teacher should skillfully blend academic content, pedagogy, and technology into their teaching to provide the best possible learning experience (Cardullo et al., 2017, p.206). Collaboration and training will improve teachers' perspectives on the role of technology in the classroom, resulting in more frequent and meaningful integration.

Student-Learning Processes and Academic Performances

Technological resources allow educators to present lessons in a variety of ways. Educators can use technology to present new methods to solve problems, introduce students to potential future careers, and provide opportunities for social interaction. Since many are at the stage of concrete operations, elementary students require hands-on practice to understand and master new

concepts (Lee & Chen, 2015, p.264). Therefore, educators often incorporate physical manipulatives into education, helping students comprehend abstract ideas and symbols. In addition to physical manipulatives, teachers can incorporate virtual learning environments that allow flexibility, choice, and collaboration during activities (Cuff, 2014, p.85). These virtual experiences can show students specifics about a certain topic, such as locations around the world, instead of reading about its characteristics in a textbook. Technology affects student-learning processes and academic performances because it provides numerous opportunities for students to demonstrate knowledge and understanding in creative ways.

Research has shown that increased ability with technology is more important than increased access. Improvement and growth in academic subjects occurs through the enhancement of technology literacy and purpose (Judson, 2010, p.273). Resources, such as iPads, can enhance student learning because they increase student motivation and independence. However, they are unlikely to have a significant impact on student learning without a well-structured purpose or clear learning objective (Greer et al., 2017, p.490). According to a 2006-2007 study, researchers monitored changes in TerraNova assessments for 5,000 students from fourth- to fifth-grade and 5,000 students from seventh- to eighth-grade. They incorporated meaningful technology usage into their classrooms and monitored the students' academic results over time. The results showed that improved technology abilities lead to confidence in academic content understanding and the use of technology as a learning tool (Judson, 2010, p.271). This research illustrates that daily practice with mobile devices can enhance students' confidence and support their learning.

Elementary educators should also use technology to produce relevant and meaningful learning experiences. Each day, they are challenged to maximize the combination of variables

that include the person, the task, the content/environment, the technology tool, and the outcome (Edyburn, 2013, p.7). By determining the best solution for their students, teachers provide new ways to access, engage with, and master the curriculum. Authentic education involves the construction of knowledge through analysis and evaluation, disciplined inquiry or in-depth understanding, and clear personal, aesthetic, or social value beyond school. To create these authentic experiences, students should learn by doing, be present in the environment, participate in real-life learning, experience sensory engagement, or interact with local context (Hedberg, 2014, p.240). These authentic experiences are enhanced through technology resources or mobile devices. Mobile learning can be used for independent and collaborative activities, and its portability allows for a customizable learning experience. It can support student-centered learning, inquiry-based pedagogies, problem-solving abilities, and increasing levels of comfort and focus with learning (Fuegen, 2012, p.50). The pedagogy of mobile learning should focus on the designed activity, the product that results from the activity, and the strategies for assessment that capture the process, product, strategy, and solution. Educators must address the content and structure of the learning activities, select appropriate technology methods to support the activities, and organize student groups and responsibilities for each member of the group (Hedberg, 2014, p.240). By focusing on these details, educators can create engaging real-world scenarios that help students can achieve desired learning outcomes through meaningful experiences. Mobile devices can facilitate learning through educational applications, multimedia viewing, interactive images, and virtual simulations or field trips (Fuegen, 2012, p.50).

Special Education

General curriculum should be accessible to all students. In 1959, the United Nations

General Assembly adopted the Declaration of the Rights of the Child, which highlighted children's needs for special care, protection, freedom, and development. Today, around 190 countries and territories around the world enforce these principles. About 8.4% of these countries' students receive special education services. Among these students, "forty percent are labeled with a specific learning disability, 18% with a speech or language impairment, 8% with autism, 6.3% have emotional or behavioral difficulties, and 2% with developmental delays in addition to several other, less-frequently occurring disabilities" (Pandya & Avila, 2017, p.123). Some believe that curriculums based on principles of UDL, or the Universal Design for Learning, are best for most students, including those with disabilities. A UDL framework works to address the diverse needs of all students and recognize the demand for flexible curricular materials and methods (Hitchcock et al., 2002, p.9). When UDL is implemented, teachers provide new opportunities for all students to access and engage in the general curriculum (Edyburn, 2013, p.8).

Digital media and computer technologies make it possible to offer a curriculum that can be displayed in a variety of ways and transformed to suit different learners. Many schools are implementing 1:1 iPad use in their classrooms. These devices are low cost and create an inclusive environment that enables individuals with disabilities to use the same mobile devices as their peers (Edyburn, 2013, p.10). Assistive Technology (AT) devices and features can be beneficial for individuals with disabilities, including low vision, non-verbal, and physically challenged students. These devices include "any item, piece of equipment, or product system, whether acquired commercially off the shelf, modified, or customized, that is used to increase, maintain, or improve the functional capabilities of a child with a disability" (Edyburn, 2013, p.7). In addition to differentiating academic content, iPads have additional AT functions that aid

students with learning difficulties. These devices often include accessibility features, such as zoom, magnify, voice over, assistive touch, or subtitles, to accommodate individuals and allow them complete the same tasks as their peers. Students with low vision have significantly profited from the movement to technology because it helps them function more independently and addresses their color and contrast needs. Other students who have difficulty concentrating often work better when they are listening to music on their device. Some students who have trouble sitting still benefit from tools that enable them to move while they are learning (Loertscher & Koechlin, 2012). The flexibility of this digital content allows teachers to incorporate "multiple representations (e.g., image, text, and video), transform one medium to another (e.g., text-to-speech or speech-to-text), or modify the characteristics of a presentation (e.g., size and color of text, loudness of sound)" (Hitchcock et al., 2002, p.9). Students can use these digital tools to research, collect or compare ideas, concept map their thoughts, and learn collaboratively with their peers without difficulty (Souleles, 2017, p.586). Through UDL lessons, teachers can make modifications and present content within commonly used programs. Teachers should provide a variety of tools for their students because it creates an inclusive classroom environment for all individuals. Technology engages student attention and encourages participation in the classroom activities. These technological tools can provide individuals with disabilities an opportunity to demonstrate their knowledge in new ways, effectively participate, and make progress in their academic development.

Individuals with learning disabilities can significantly benefit from inclusion in digital media and learning. Therefore, educators require the knowledge necessary to implement these devices. This knowledge should include awareness about available devices or features and how to purposefully implement those resources. When teachers lack knowledge or awareness about

AT functions, students are not receiving the best possible learning experience (Coleman et al., 2015, p.655). These resources can increase student independence and provide meaningful participation in educational learning. It is essential that educators recognize how technology can help individuals with disabilities achieve their goals. That way, educators will incorporate the resources and advocate for their use (Edyburn, 2013, p.21). Effective inclusion and curriculum access occurs when teachers demonstrate proficiency with differentiation and provide diverse methods for learning and success (Coleman et al., 2015, p.638). Teachers can design well-rounded inclusive instruction with technology integration and AT accommodations. This comprehensive education supports individuals with disabilities, encouraging meaningful participation and engagement with productive technology.

SAMR Model

When designing effective learning experiences for students, the SAMR model can be useful. The SAMR Model was developed by Dr. Ruben Puentedura, and it helps teachers think about how technology impacts learning. This concept illustrates the progression of technology integration, moving from the enhancement to the transformation of student learning (Theisen, 2013, p.523). It consists of four levels: substitution, augmentation, modification, and redefinition. The model encourages teachers to move from lower to higher levels of critical thinking by teaching with technology. This instructional transformation can lead to higher levels of learning and understanding. The substitution and augmentation phases are more teacher-centered and focus on using technology to accomplish traditional tasks. The substitution level involves teachers using basic technology to perform the same task as before while the augmentation level acts as a direct tool substitution with some functional improvement of the

task. The next two levels, modification and redefinition, involve technology that begins to transform learning. The modification level allows for major task redesign while the redefinition level provides experiences that cannot be accomplished without the use of technology. This concept highlights the various functions of technology, including its instant access to resources, increased communication, and educational resources (Greer et al., 2017, p.490). The SAMR Model encourages improved technology skills, which can lead to lifelong skills of independence and self-directed learning abilities (Cuff, 2014, p.80). Teachers can use the SAMR Model to evaluate their technology integration and strive to reach higher levels of critical thinking in student learning.

Bloom's Taxonomy

Bloom's Revised Taxonomy emphasizes the importance of motivating students through higher order thinking skills and metacognitive assessment (Smith & Darvas, 2017, p.29). This model focuses on high-level cognitive processes and consists of six main domains of learning. These domains are written in measurable verbs to help describe and classify observable knowledge, skills, and abilities. These verbs include remembering, understanding, applying, analyzing, evaluating, and creating. Teachers use this as a tool for the planning of teaching and assessment of learning outcomes. Bloom's Taxonomy helps teachers consider the student learning outcomes or goals when developing lesson activities and evaluations (Goksu, 2016, p.136). It is relatable to many because it is commonly used with pre-service teacher preparation programs, classroom pedagogies, assessment programs, and educational research (Agarwal, 2018). By using this model to create learning objectives, both teachers and students understand the purpose of the activity and what must be done to demonstrate their learning. Combining

Bloom's Taxonomy with technology integration helps teachers determine the best approach for student learning and maximizes their resources. It is not enough to just use technology in the classroom. Instead, it needs to be incorporated purposefully. Bloom's Taxonomy emphasizes how the technology is implemented and its impact on learning (Greer et al., 2017, p.490). Clear learning objectives can generate increased comprehension, meaningful learning opportunities, and essential skills for future success.

Significance of Technology

Educators can use technology to create engaging lessons, incorporate diverse activities, and help students acquire content knowledge. With the evolution of education and its standards, students need to develop valuable skills that can lead to success in future education and business settings. Classroom learning has changed, replacing traditional paper-based materials or methods with Web 2.0 tools. Web 2.0 tools can include educational gaming, video-conferencing, social networking, blogging, podcasting, e-mailing, and streaming media. Users are now able to work independently or collaboratively, discover, organize, and interact with information, and publicize their findings for others (Cuff, 2014, p.75-77). This shift in classroom resources provides countless opportunities for student learning. Teachers can use their students' personal interests to integrate real-world stories, historical events, relevant scenarios, and activities found online. This engages students in learning and increases their content knowledge (Van Loo, 2012, p.16). Students can recognize how research skills learned in the classroom can be applied to topics or situations in the outside world. This encourages them to become lifelong learners and involved members of their communities.

Advancements in technology, including iPads or other tablet computers, have expanded learning possibilities in schools. Educators recognize the versatility of mobile devices and

appreciate their lower cost and increased portability (Larabee et al., 2014, p.450). Teachers can integrate technology in the classroom by using engaging activities, such as competitive activities or games. Students can use games to acquire new information regardless of their prior knowledge, learning style, and unique needs (Shin et al., 2011, p.542). Game features, including clear goals or rules, learner control, challenging tasks or feedback, and repetition, help teachers create individualized learning environments. These help students take a more active role in their learning, improving their overall achievement and success. Results of one study show that students who played a technology educational game outperformed those who played a similar paper-based game. Conclusions also demonstrate that frequent game play correlated with improved results regardless of student ability level (Shin et al., 2011, p.558). Although studies provide evidence that technology positively impacts elementary students' learning, further research is needed to examine how game features should be designed to promote individualized instruction. More research could identify the effectiveness of technology-based games on higher-order thinking skills, including creativity, problem solving, and decision-making abilities (Shin et al., 2011). This information could encourage the development of more efficient technology resources for educators.

Other effective methods of technology include virtual manipulatives and digital texts. Virtual manipulatives are interactive, web-based visual representations of objects that help students understand new information (Lee & Chen, 2015, p.264). These allow students to visualize concepts, breaking down the content of learning for presentation purposes. Virtual manipulatives are equipped with variability, unlimited supply, and the simultaneous presentation of figures and symbols. These resources save teachers from the time-consuming distribution, cleanup, and organization of physical manipulatives. Although evidence related to the use of

virtual manipulatives is relatively new and somewhat limited, research indicates that students using virtual manipulatives learned as effectively as students using physical manipulatives (Lee & Chen, 2015). In addition, digital texts are also easily accessible, portable, and intriguing for students, encouraging students to read more (Thoermer & Williams, 2012, p.441). These resources include interactive learning tools, allowing students to utilize features such as hyperlinks, videos, glossaries, pronunciation guides, examples, and dictionaries (Cardullo et al., 2017, p.206). By manipulating features such as the font, dictionary, text-to-speech features, and note-taking abilities, students are given some autonomy or self-regulation in the learning process. They learn to take responsibility for their own learning and determine which features best help them comprehend the material. Digital texts can be used for a variety of activities like fluency lessons, read-alouds, or Readers' Theatre. The flexibility of digital texts ensures improved accuracy, automaticity, and prosody, fluency, and comprehension. When students complete a task proficiently, they are more likely to enjoy the activity and associate positive dispositions towards the subject (Thoermer & Williams, 2012, p.445). Virtual manipulatives and digital texts can lead to enhanced student understanding, independence, and positive attitudes towards future academic learning.

Although there may be limitations with technology, including storage space, battery life, format errors, and potential distractions from school work, there are strategies to address many of the present issues. Educators can use cloud-based storage for content delivery as well as minimalistic software to maintain battery life and reduce space used on devices. For formatting errors, educators can add captions or descriptive text to media, accept flexible assignment formats or final products, and allow opportunities for editing of content. Teachers can group students based on technological abilities and provide an accessible instructional climate for

struggling students (Fuegen, 2012, p.52). There are also available resources where teachers can monitor student activity and address distracted behaviors by "locking" the students' screens if they become off-task. Overall, the increased flexibility, instant access to information, development of essential life skills, and educational benefits seem to outweigh the disadvantages.

There are numerous effective resources in educational technology that allow the building of collaborative ideas, projects, writing, and thinking in real time. These tools have numerous functions and activity capabilities that can increase motivation, engagement, collaboration, and problem-solving skills. Resources, such Podcasts, online auditory dictionaries, and iPads, can address the needs of visual, tactile, and kinesthetic learners (Loertscher & Koechlin, 2012). Additional resources, such as Google Docs, Google Draw, Google Presentations, PowerPoint, web-based videos, notebooks, tablets, or smartphones, have changed the way students present information, record notes, or research concepts. This learning transformation has caused teachers to reevaluate the nature of their established learning environments and look for modern adjustments. Technology illustrates the need to create learning environments that make the best use of available resources (Rawlins & Kehrwald, 2014, p.215). When incorporated appropriately, technology can enable the generation of new ideas, collaboration, immediate and specific feedback, content understanding, and enhanced enjoyment of learning.

Conclusion

In conclusion, it is important to recognize that children learn in different ways. When creating authentic activities, we must understand that there is not only one possible solution. Students can benefit from technology because they can demonstrate their understandings in countless ways. Technology allows them to apply their knowledge or what they have learned to

creatively solve problems (Hills, 2017, p.9). Some teachers may argue that they are not comfortable with technology integration, but it is possible that they lack awareness or experience in the subject. Their perceptions are likely to improve through additional hands-on training, especially during pre-service teacher preparation programs or professional development opportunities for current educators. Educators need more in-depth time to explore and learn about resources in order to use technology effectively. They do not need to incorporate every resource available. Instead, they need to determine which resources will most effectively enhance their students' learning experiences and understanding. Time for exploration will help teachers stay aware of new programs and keep students up-to-date in the technological world. Awareness and access to technologies increases teachers' opportunities for meaningful teaching experiences and successful opportunities for student planning, monitoring, and reflecting on their learning.

To create effective learning environments, teachers can use strategies, such as the SAMR Model and Bloom's Taxonomy, to efficiently combine technology use with strong learning objectives. Once teachers introduce a resource to students, they can gradually increase the task's complexity and enhance each stage of the students' learning process. The final product constructed by students is likely to be more effective and reflective of their ability to apply what they have learned (Cuff, 2014, p.95). It is important for teachers to understand their students and use that knowledge to determine which technologies will best enhance and transform their teaching (Jacobs-Israel & Moorefield-Lang, 2013, p.16). Teachers should create environments that purposefully blend technology with learning goals. This effective use of technology contributes to improved abilities in collaboration, critical thinking, and creativity, and it prepares students for their future lives with relevant and authentic learning experiences.

Theoretical Perspective

The use of technology in the classroom builds a background of knowledge for students using authentic and meaningful experiences. It can lead to improved skills with open-ended thought processes, flexibility, and inductive reasoning (Cuff, 2014, p.78). Technology creates an engaging learning environment and positively influences student learning and academic performances. There are constantly new updates in technology, and this guidebook should be added to in the future. However, it contains several programs for teachers to use as a starting point when determining different ways to conduct their lessons.

This project falls under the critical theory category. The topic of technology involves changes over time, especially with advancements of programs and devices. My project helps improve the learning experiences for students, preparing them for future technology use in their own lives. Educators should encourage student-centered learning values because they enable students to think critically, take ownership of their work, and become independent in other areas of life (Smith & Darvas, 2017, p.29). Informal input from colleagues, such as comments or discussions, helped initiate my research. However, I selected and researched programs independently.

Through this guide to technology, I believe teachers will gain a better understanding of each website, app, or resource. As a result, it should save them from time and stress of researching unknown programs. When using various programs, teachers should reflect on the benefits and limitations of the technology, how the resource impacted their learning, and how the technology can be used within their own practice (Polly & Rock, 2016, p.342). They can use my descriptions to determine how appropriate the learning tool is for their classroom. They may

also learn new strategies on how to incorporate the technology through my examples. Teachers can help students gain more experience with these programs, improving their technology use and helping them succeed in the technological world of their daily lives.

Statement of Bias

The completion of this research did include my personal bias. I applied my own framework when independently evaluating the programs. Therefore, my prior knowledge of technology, which comes from personal experience and exposure, may have affected my ease or difficulty when using the programs. It is also possible that the programs I evaluated may be used in additional ways to what is listed. Since my personal interest is to benefit my sixth-grade students, my evaluations focused on how to use these programs with that specific age group, class size, and English/Language Arts (ELA) subject-matter. I typically work with 25 to 30 students each day. I kept in mind their learning styles and academic levels when determining how these programs could be incorporated.

The topic of technology involves changes over time, especially with advancements with programs and devices. With my project, I strived to improve the learning experiences for students and support them in their use of technology throughout their lives. I created a website to:

- Provide a supportive resource that informs teachers about available technology resources for elementary education.
- Ensure that teachers evaluate their implementation of technology, helping students develop essential knowledge through a variety of activities.

Methods: Project Design and Description

This qualitative research project focused on technology integration in the Chicago area. My research aimed to assist English/Language Arts (ELA) educators of students in 4th-6th grade. I mainly focused on programs involving iPads or computers, but I was open to researching additional, engaging tools. When choosing programs to evaluate, I initiated my research with informal input from colleagues. Educators often share their experiences with lessons or technology tools in passing conversations, and I was able to use these discussions as a starting point for my research. I incorporated their suggestions into my own personal investigation and began researching the most commonly referenced resources. During my independent exploration, I discovered new resources that were widely recognized and repeatedly displayed among search results. My data collection or research extended over ten months, discovering programs from February to November in 2018. My focus questions included:

(a) What technological resources are commonly used in classrooms?

(b) How are these resources used?

Some of my informal discussions provided ideas for integration strategies, but many details were listed on the resources' websites of how the tool can enhance student learning. They provided examples of how educators use the resources in their classrooms, and I created a running list of the resources, taking notes on how other educators were using these programs. There were no ethical issues with this research because I did not report on any specific person. My research focused only on the technology, not the teachers or the students.

When analyzing the data, I incorporated my own framework to evaluate the resources. My

evaluation criteria combines the SAMR Model with Bloom's Revised Taxonomy. I chose to develop this method because both systems provide clear learning objectives that enhance student learning experiences as educators move to higher categories. For each program, I used the measurable verbs from Bloom's Revised Taxonomy to describe and classify observable knowledge, skills, attitudes, behaviors, and abilities. These actions clearly identify what students must do to demonstrate their learning. In my evaluation framework, I used these action verbs to summarize each resource's capabilities in a concise manner. These action verbs fall under the various categories of Bloom's Taxonomy. Throughout my evaluation, I added a few adjustments to the action verbs list (Appendix C). These additions reflect integration strategies that I felt were not clearly represented by the original list. When I learned how the resource could be used, I listed the action verb in the chart, allowing viewers to gain a brief understanding of the tool's potential functions.

Findings

When I first began my project, I had developed a model to analyze and evaluate technological programs (Appendix A). This model combined the SAMR Model with Bloom's Taxonomy. Since the SAMR Model only focuses on technology, I wanted to include a learning component that builds student critical thinking abilities. This ensures that teachers are creating learning environments that make the best of their available technology. The first portion of my evaluation criteria, the SAMR Model, is used in my school district. It supports and enables teachers to design, develop, and infuse digital learning experiences that utilize technology. The goal of this model is to transform student learning experiences, so they result in higher levels of student achievement. Teachers are encouraged to move along the model from Substitution to Redefinition, by incorporating meaningful technology resources to transform learning tasks and create new products.

The second portion of my evaluation criteria, Bloom's Taxonomy, is a classification system that encourages various learning outcomes depending on the task provided. The components include Remember, Understand, Apply, Analyze, Evaluate, and Create. As teachers incorporate tasks using this model, they will notice that it allows for more higher-level thinking skills. Teachers are able to present ideas and concepts at different levels to meet the diverse needs of their student learners.

To begin the project, I informally communicated with other educators to determine what resources they were using in their classrooms and how they were using those tools. Some teachers provided additional information by describing their successes or issues during the resource's use. I took special note of frequently mentioned resources and added each program

into a running document. Once I learned information about a new resource, I researched the program and learned about its major features. The list grew quickly, demonstrating how discussions with my colleagues and educator reviews published online enhanced my website development and guided my research.

When evaluating resources, I first looked for summarizing descriptions through each program's main website. Most websites provided explanations of their program and what to expect when using it. After determining what the program was used for, I looked at examples of how the program was used in other educators' classrooms. Some websites described these in detail. Others required me to read reviews from commenting customers. After this initial research, I created accounts with each program, if one was needed. I only created accounts for programs that were free. However, I was able to use some of my district subscriptions for access to programs that cost additional fees. I used this access to explore each program, creating activities that were useful or relevant to my own classroom. From this hands-on experience, I was able to develop a solid understanding of the program's features. I realized that I learned more when I took on the "student role" during the program usage. As I created example activities, I was able to practice the programs' features and discover success through trial and error. I added all of my findings to my running list of notes and incorporated the key details into my final program descriptions.

As I began to compile this extensive list of programs, I noticed that some programs did not perfectly fit into my initial evaluation criteria (Appendix A). Some resources would rank lower on the SAMR Model but higher when looking at Bloom's Taxonomy. Others were able to fit in multiple categories. This caused me to reevaluate my own evaluation process. I created a new

evaluation criteria chart that gave each category of SAMR the opportunity to demonstrate Bloom's Taxonomy (Appendix B). From this adjustment in my thought process, I realized that it is not just the resource that matters when creating effective lesson plans. The more important component is recognizing how the program is being implemented. This proves that technology resources do not determine efficiency. The teachers do. Although technology offers numerous learning possibilities, the resource is still limited if the teacher chooses not to utilize certain features. Therefore, it is more important to support teachers in designing technology-enabled learning experiences instead of simply promoting the use of technology (Green, 2014, p.42).

Most technological resources can be used in a variety of ways. Therefore, the teacher's assignment or strategy on how to use the program is what plays a key role in its classification. My evaluation adjustment ensured that I could provide educators with crucial information regarding technology implementation. On a daily basis, educators strive to establish independent learners by incorporating creative, authentic learning experiences, resource-based exploration, and critical thinking opportunities (Cuff, 2014, p.80). I kept this in mind throughout my research and discovered how the programs could potentially reach the various categories of Bloom's Taxonomy and fulfill the students' need for technology access.

Overall, my completed list contains 35 evaluated programs. Appendix D provides an abbreviated overview of the assessed programs and how they ranked within my evaluation criteria. Based on my results, the most common Bloom's Taxonomy category was Understand with 23 resources meeting the criteria. Remember was recognized within 21 resources, Create within 19 resources, and Evaluate within 16 resources. Both Apply and Analyze were observed within a lower number of resources. Apply was found within 6 resources, and Analyze within 5

resources. This illustrates the need for further research in these categories. My findings also display the need for additional exposure to discover if there are additional ways to incorporate these programs. It also proves that my list should be added to in the future, ensuring that the website and my technological understanding stay current. This final product should help other educators build their virtual repertoire and design meaningful tasks that have a significant impact on their students' learning outcomes.

Product: Website Project

This website project is a compilation of technology resources, information, and illustrated examples to show potential for use. The selected programs are appropriate for fourth through sixth grade, English/Language Arts classrooms. However, I believe they can be modified to reach other age levels or subject areas. Throughout the site, I shared information that will help teachers appreciate key aspects of each program, helping them determine whether it is appropriate to use in their own classroom or subject area.

In the following sections, you will find an overview of my website and its contents. When the description states, "Example available," it indicates that further evidence is present on my website. This evidence demonstrates or illustrates the tool in use. I provided helpful images for teachers to recognize and become familiar with program formats. The final project is available to all individuals, using the following link: https://rdobrich.weebly.com/. Currently, my website is divided into seven key pages:

1. **Home**. I introduced the project and explained my reasoning for its significance.

> *I developed the idea for this project during my first year of teaching. I realized how many teachers' lives are consumed with unending responsibilities. These responsibilities, such as grading, lesson planning, and differentiating lessons, can take up a lot of one's time. Educators want to provide the best possible learning experience for their students. It is our responsibility to make the content engaging and relevant to the lives of the students.*
>
> *Technology is constantly changing, and it is essential that we stay current with*

those trends in the classroom. However, when are we given the time to explore the available resources? Is the resource going to enhance the learning experience for our students? I wanted to determine a solution to this dilemma. This website is dedicated to technology integration in the classroom. I have researched and classified each program following the SAMR Model and Bloom's Revised Taxonomy. I am hoping to provide teachers with enough information on each program, so they can determine whether it is "worth it" to invest their time on the resource.

As of December 2018, this website contains about evaluated programs. The "Evaluation Findings" Chart on the SAMR/Bloom's Taxonomy page will reflect all changes and indicate the date of when update occurred.

2. **SAMR & Bloom's Taxonomy**. This page includes information about the SAMR Model and Bloom's Revised Taxonomy. At the bottom of the page, I have provided my overall evaluation findings of each resource. Refer to Appendix D for an abbreviated version of the chart.

   SAMR Model. Each technology program has been classified vertically using the SAMR Model. The SAMR Model, created by Dr. Ruben Puentedura, has four levels that explain the increasing impact of technology integration. This classification uses the following categories:

   - Substitution: The program acts as a direct tool substitute, with no functional change.

- Augmentation: The program acts as a direct tool substitute, with functional improvement.
- Modification: The program allows for significant task redesign.
- Redefinition: The program allows for the creation of new tasks, previously inconceivable.

Bloom's Revised Taxonomy. The Bloom's Taxonomy categories include:

- Remember: Students exhibit memory of previously learned material by recalling facts, terms, basic concepts, and answers.
- Understand: Student demonstrate understanding of facts and ideas by organizing, comparing, translating, interpreting, giving descriptions, and stating main ideas.
- Apply: Students solve problems to new situations by applying acquired knowledge, facts, techniques, and rules in a different way.
- Analyze: Students examine and break information into parts by identifying motives or causes. Students make inferences and find evidence to support generalizations.
- Evaluate: Students present and defend opinions by making judgments about information, validity of ideas, or quality of work based on a set of criteria.
- Create: Students compile information together in a different way by combining elements in a new pattern or proposing alternative solutions.

Bloom's Revised Taxonomy Action Verbs. Bloom's Taxonomy provides measurable verbs that help us describe and classify observable knowledge, skills, attitudes, behaviors, and abilities. These action verbs clearly identify what students must do to demonstrate their learning. In the chart**,** I used these action verbs to summarize each resource's

capabilities. These action verbs fall under the various categories of Bloom's Taxonomy horizontally, depending on its meaning. Blank boxes indicate that I did not recognize a key function in that category.

Evaluation Findings. This evaluation chart has been uploaded using Google Docs, ensuring that all updates are displayed instantly on the website. For more information on each resource, visitors will look at where it falls on the SAMR classification and visit the corresponding page. These four pages include Substitution, Augmentation, Modification, and Redefinition. Each program is listed alphabetically in the chart and on the webpages.

3. **Substitution**. Refer to Table D1 for a breakdown of the Substitution category. The Substitution page currently includes the following programs:

    - **Dictionary.** The Dictionary app is a free program that helps students expand their vocabulary, listen to word pronunciations, and study grammar and language. This resource provides synonyms, antonyms, and extra information or activities to support word development and understanding. In my classroom, students use this resource to look up new vocabulary terms as they read. This is a quicker way to define new terms than using a standard dictionary book. I have also noticed that my students are more likely to look up terms online than retrieving the information from a book.
    - **Google Docs.** Google Docs is a program that is very similar to Microsoft Word. This word-processing program allows students to type information, editing the format of the page. Google Docs is online and automatically saves students' work without the need to select any buttons. Students can collaborate with others by sharing the document, allowing multiple students to work on the same

assignment at one time, regardless of their location. Another benefit is that teachers can monitor how much each student contributes to the final product. In my classroom, I use Google Docs for most of my assignments, especially constructed responses or written assignments. I'm able to monitor the students' progress on the assignment and provide feedback in a comment on their document. Example available.

- **IXL.** IXL is a website that reinforces lesson content through repetition. The Language Arts categories include reading, writing, vocabulary, and grammar/mechanics skills. This website allows students to independently practice concepts they have learned in the classroom. The Real-Time feature keeps teachers updated on how the students are doing at that moment. If the student's box turns red, teachers can recognize that the student is struggling with the concept and work with the student immediately. The Analytics feature collects the students' data, helping teachers target their lessons on what will most help their students. Teachers can also use the reports to view how many problems were attempted and how much time the students spent working on the concept. In my classroom, I use this resource as a supplement to our Grammar and Reading curriculum, practicing skills that we have covered in class. I believe this improves their understanding and mastery of the content.
- **Kahoot.** Kahoot is a free game website that can be accessed on a computer or online. Teachers can quickly create a game or a "kahoot" to review content covered in the classroom. These kahoots can assess students' understanding through multiple choice questions. Videos or images can also be added to the

questions. While questions are displayed on one shared screen, students participate by logging in from their own device. However, no student accounts are required. Students select the color on their screen that matches their desired answer choice, competing against each other to answer the questions quickly and correctly. Students can also play globally, connecting with other players in over 180 countries. In my classroom, I use this tool to review for upcoming assessments, such as vocabulary or reading quizzes.

- **Pages.** Pages is a word processor for the iPad. This program can be used to combine text, graphics, diagrams, tables, various templates, and basic editing features. It can sync documents on a desktop computer through iCloud. However, it does not allow drawing or annotating in the app. For my classroom, I use this to create word documents when I do not have internet access.
- **Plickers.** Plickers is a free card activity that collects formative assessment data. It provides instant feedback in a poll format and saves data for each student. Plickers can be used as a quick check for understanding without student devices. To conduct this activity, teachers can pass out the "paper clicker" and use their iPad to scan the room of student responses. Teachers can prepare and organize their questions into sets, playing the assessment questions directly from their library. In my classroom, I have used this as a review alternative for vocabulary or reading assessments. I believe one downfall to this program is that it requires the paper cards, which may take more time for set up and completion.
- **Quizlet.** Quizlet is a free website that teachers can use to create digital flashcards. These cards can be used to study or remember information, collaborate with other

teachers, and play Quizlet Live. Students can also make flashcards, practice spelling, play learning games, test their knowledge, and collaborate with others. Quizlet Live is a way for students to collaborate and compete against one another. Students do not need to create an account. Instead, they log in with a class code and are randomly assigned to teams. Students must work together in order to win the game. In my classroom, I upload our vocabulary lists and story content, such as vocabulary terms, characters, settings, and plot elements. Students use this to study throughout the week and review crucial information.

- **Spelling City.** Spelling City is a free website that focuses on building spelling, vocabulary, and comprehension skills through instant feedback activities. Teachers can access free lesson plan ideas and supplemental materials. They can also customize word lists and groups, differentiating for the diverse learners in their classrooms. The "Word Lists & Lessons" section offers video lessons, enrichment strategies, and spelling resources. Lessons cover a variety of topics including analogies, compound words, and figurative language. A premium membership is available for purchase. In my classroom, I have used this resource to upload student spelling lists. Students use this source to practice their spelling words and play games based on their word list. Students can use this to review and complete their spelling assessments.

4. **Augmentation**. Refer to Table D2 for a breakdown of the Augmentation category. The Augmentation page currently includes the following programs:

    - **BrainPop.** BrainPop is a free website that incorporates interactive learning materials, covering a wide variety of topics like English, Science, Social Studies,

and other subject areas. It provides engaging games, animated movies, quiz questions, and activities that encourage an enhanced understanding of content. The animated videos incorporate narratives and humorous characters, providing additional and relatable ways to connect to key concepts. In my classroom, I use these videos when teaching grammar concepts or providing background knowledge on stories we are reading. For example, we read a story on Jane Goodall, and I was able to show this video to give students a better understanding about her life. We also take the quizzes together as a class, allowing me to assess their knowledge. I believe that a paid subscription is worth the purchase because the free subscription limits topic access.

- **Google Classroom.** Google Classroom is a free program that allows teachers to organize all classroom content in one location. Teachers can post and collect assignments electronically. They can also post core curriculum materials digitally for students to access. Students can use this program to participate in online discussions, posting ideas and responding to other classmates' thoughts. In my classroom, I use this resource daily to post homework assignments, polls, discussion posts, Quizlet Reviews, Google Forms quizzes, and other resources for my students to access. I have been able to provide feedback more quickly to students on each assignments, and it keeps record of all students' grades.
- **Google Drive.** Google Drive organizes all Google documents. Individuals can create and edit word documents, spreadsheets, and presentations, keeping everything together in one central location. In my classroom, I use this feature daily to save all of my Google Documents, Google Forms, and Google Slides. I

like how I can use Google Drive to share editing permission with colleagues and access my documents anywhere with internet access.

- **Google Forms.** Google Forms is a free website that allows students to complete polls, surveys, or even graded assessments. This program collects students' results digitally and scores their responses instantly. In my classroom, I use Google Forms to conduct most of my online assessments. These include vocabulary quizzes, grammar assessments, exit cards, surveys, and other components that I want quick feedback on. Google Forms grades all of the multiple-choice data and saves me a significant amount of time grading. Students are also able to answer short-answer questions, but I do need to manually grade those responses.
- **Google Slides.** Google Slides works similarly to Microsoft PowerPoint and allows students or teachers to create, edit, collaborate, and present presentations. The main difference between Google Slides and Microsoft PowerPoint is that Google Slides requires internet access. All changes are saved automatically, and all products can be accessed from any location. Google Slides is also a great resource for creating worksheets or handouts. This program includes a variety of themes, fonts, and the opportunity to add images, videos, and sounds. It is very user-friendly and allows individuals to format images or text boxes quickly. In my classroom, I use this resource to establish a weekly digital form of communication with parents and students. I created a newsletter and posted it on my classroom website to keep parents aware of occurrences in the classroom. I

also use it to make class notes, worksheets, and presentations to introduce new concepts. Example available.

- **Keynote.** Keynote allows individuals to create presentations, similar to Microsoft PowerPoint or Google Slides. Keynote is the better option when no internet access is available. It incorporates various effects, such as layouts, shapes, transitions, charts, photos, and cinematic effects to create engaging final products. Individuals can also create diagrams or illustrations. The Keynote Live feature allows you to invite people from other locations to view the presentation in real time. It can also be displayed on the classroom projector for whole-group presentations. In my classroom, I use Keynote to create presentations or slideshows. I have used it to display bell ringer activities on the board. Each day represents a slide, organizing slides for the week.
- **I-nigma.** This free iPad app is a mobile barcode or QR code reader. After scanning the barcode with this app, students are connected directly to the internet link. In my classroom, I use QR codes for bathroom sign outs or late assignments. When students scan the code through I-nigma, it opens them to a Google Form to complete. Google Forms organizes all of this data for reference if needed.
- **Newsela.** Newsela is a free website that provides adaptive reading content for various skill levels. It also provides opportunities for quizzes, annotations, vocabulary lessons, and writing prompts. Teachers can narrow down article results based on topic, reading level, or learning standard. Once an article is selected, teachers can adjust the Lexile levels to differentiate the same story for

the diverse learners in the classroom. Teachers can create an account for free, and it can be integrated into Google Classroom. In my classroom, I have used Newsela to supplement a certain concept by informing students on related current events. I have also used it to create background knowledge before reading a story, engaging students in the content. I print out different Lexile levels to accommodate the different skill levels in my classroom. Although the levels change, the stories still provide the same key details.

- **Notability.** Notability is a note-taking app that allows individuals to record sound along with the notes that they take. You can choose different paper backgrounds and add figures, drawings, or pictures to your notes. You can also annotate PDF files. This resource costs $9.99 to download from iTunes, but I think that its flexibility is beneficial for educators. In my classroom, I've displayed this resource for the class and modeled how to take notes. It's an easy way for teachers to demonstrate their note-taking think alouds and provide examples for students. Students then make the same annotations in their own notebooks.
- **Screencast-o-Matic.** Screencast-o-Matic is a free website that allows individuals to create and present video recordings or lectures. Students can use this program to verbally explain how they answered a question or solved a problem. Individuals can import videos, edit narration, and add text or images. This program can be integrated into Google Classroom, Moodle, Canvas, or other resources that may already be used in the classroom. In my classroom, I have used this resource to record online directions for repeated use. Example Available.

- **Sketchbook.** This Autodesk iPad app is a free drawing program for students and educators. It encourages creativity with sketching tools. Students can draw on their iPads in a realistic manner, using pencils, inks, markers, and brushes. The Scan Sketch features allow you to import your physical art from a piece of paper and change it into digital artwork. In my classroom, I have used this resource for vocabulary assignments. Students draw pictures of their vocabulary words, demonstrating their understanding of the words. I have them screenshot their images and upload them to Google Classroom, so I can assess their comprehension. I have also had students to draw images that relate to their journal entries or writing samples.
- **Socrative.** This free app allows teachers to create and edit their own library of assessments for students. They can create quizzes, polls, and exit tickets using multiple choice, true/false, or short answer questions. Then, they receive instant feedback on student understanding in real-time and generate reports on the data. In addition, students can compete in "Space Races," racing across the screen with correct answers. I have only used the free account which allows 50 students to participate per session. I believe this is efficient for classroom use, but there are Socrative Pro editions available for purchase that allow for rosters or restricted access for students. In my classroom, I have used this resource to review vocabulary terms, story characters, and literary terms in preparation for upcoming assessments.
- **Trading Cards.** This free ReadWriteThink app allows students to share their understanding of various topics, build study aids for school, or create their own

world of fictional characters. Each category has guiding questions for creating information on the trading cards. In my classroom, I have used this resource after students read a story in class. They make trading cards about each main character, allowing them to work summarizing skills and putting only the most important information on the card.

- **YouTube.** YouTube is a free website for watching and uploading videos to the public. Teachers can use pre-made videos to supplement content learned in the classroom. They can also create and upload videos onto YouTube, providing lessons or lectures for students to access outside of class time. In my classroom, I have used YouTube videos to reinforce lessons or provide background knowledge on a subject. I have also uploaded instructional or step-by-step videos that teach students how to accomplish a task. This allows students to view the directions as many times as they need in order to retain the information. Example available. However, educators should always watch the video in its entirety before showing it to the class. Some videos or advertisements are not appropriate for the school setting. To address these issues, there are certain tools that can be used to limit the displayed content. These include:
    - **AdBlock for YouTube.** This free Chrome extension removes all ads shown before and during YouTube videos.
    - **DF Tube (Distraction Free for YouTube).** This free Chrome extension allows teachers to remove advertisements on YouTube. Teachers can choose to hide sidebars, comments, playlists, etc. This reduces distractions and eliminates inappropriate content for students.

- **Enhancer for YouTube.** This free Chrome extension allows users to adjust their YouTube experience. Individuals can control volume levels, playback speeds, advertisements, video annotations, themes, etc. Once activated, users can check boxes to determine which features they want available during their video viewing.
- **Hide YouTube Comments.** This free Chrome extension permanently hides all user comments on YouTube. Once activated, there is no option to show the comments again.
- **SafeShare.tv.** This free website reduces advertisements and unrelated content from YouTube videos. To use this website, copy and paste the YouTube URL into SafeShare.tv. It will generate a new code that contains only the video and basic controls to watch its content.

5. **Modification**. Refer to Table D3 for a breakdown of the Modification category. The Modification page currently includes the following programs:

   - **Breakout.** Breakout EDU is a resource that incorporates critical thinking, collaboration, creativity, and communication into learning through "escape room" activities. Breakout EDU Kits are supplemental and include a collection of reusable locks, boxes, and items that are used to play learning games. However, they can also be incorporated without the physical objects, using virtual manipulatives instead. Students work together to solve problems, draw conclusions from clues, and unlock the boxes. Teachers use their online account to access pre-made games or create their own "escape room" scenarios. The free account does grant access to all user-generated games and access to the Breakout

EDU Resources. Paid subscriptions allow extra access to subject pack games, digital game creator, and student accounts. If teachers do not have access to a lock or box, teachers can use an "online lock" through Google Forms. In my classroom, I have facilitated several breakouts, and I have noticed many positive results. Students collaborate to solve problems, and leaders begin to emerge from the group to combine findings. The only downfall is that some students take a more laid back approach to the game and wait for others to figure out the clues. Teachers can address this by conducting these activities in smaller groups instead of whole-class activities.

- **iPhoto.** This free iPad app stores photos in one location. It can be used for photo-editing and includes numerous photo-enhancing features, such as filters and text layers. There are various opportunities for touching up photos, incorporating exposure, brightness, or sharpness. In my classroom, students use iPhoto when creating presentations or stories. They take photos and edit them for visual representations in their final products. Example Available.
- **Nearpod.** Nearpod allows instructors to create or find lessons from a library, interact with students through activities, and see immediate student feedback or responses through formative assessments. This program ensures 100% student participation because teachers can observe each student's response from their screen. Teachers can create a free account, which is enough to accomplish effective lessons, but a paid subscription provides more features and access to all Nearpod creations. In my classroom, I use Nearpod for lessons on grammar, figurative language, or even reading concepts. I often tie in in fill-in-the-blanks,

matching, and virtual field trip activities to enhance student understanding about a topic. I also check for student understanding through various activities, such as drawing, responding to open-ended questions, taking polls, or answering quiz questions.

- **Popplet.** Popplet Lite is a free concept-mapping iPad app that allows individuals to capture and organize ideas. Students can sort concepts visually, building graphical maps with text, pictures, lines, and arrows. Students learn to create relationships between new ideas and plan projects. It can be used to study for assessments, take class notes, brainstorm new ideas, and create diagrams. The premium version, Popplet, costs $4.99 to download on iTunes, and it provides unlimited boards and access to the Popplet boards of other users. In my classroom, I have had students create graphic organizers and screenshot their conclusions. They post these images on Google Classroom, and I am able to assess their understanding of the content.

6. **Redefinition**. Refer to Table D4 for a breakdown of the Redefinition category. The Redefinition page currently includes the following programs:

    - **Book Writer.** Book Writer allows individuals to make multimedia books and share their creations with others. Students can use this app to take notes, organize thoughts, or develop interactive books. They are also able to draw or edit images using the Pen Tool. The current version of this program is available for $3.99 on iTunes, but I have downloaded the older versions for free. It still works well to accomplish the desired task. In my classroom, I have used this resource when

teaching students about plot elements. They write their own stories and add pictures, text, voice recordings, songs, and videos. Example available.

- **Diigo.** This free Chrome extension or iPad app allows individuals to bookmark, tag, sticky note, highlight, annotate, and archive webpages. Individuals can annotate web pages or PDFs directly as they browse online, importing their findings into the Diigo library. The premium version costs $40 per year, providing unlimited bookmarks, highlights, and storage. However, I feel that the free version is efficient, providing 500 bookmarks and 100 PDF highlights per account. In my classroom, students use this resource to practice evaluating data. Students organize research information for their "Big 6" projects, presentations, or research papers in preparation for their final products.
- **Google Hangouts.** This free feature allows individuals to message and video chat one another. Users can perform a group video chat with up to 25 users at a time. Students can use this video conferencing to tell a story or to collaborate on a group project. Teachers can also use this feature to include students who may not be physically present in the classroom. There can be difficulties with reception; sometimes, excess noise can be heard in the background. In the past, I have used Google Hangouts to conduct online meetings with colleagues for team meetings.
- **iMovie.** This free program allows students to choose or record video clips. They can bring a story to life using this online multimedia application or even create movie trailers. Students are able to add titles, transitions, themes, soundtracks, text overlays, music, and effects to create a final iMovie Presentation. Students

can share their final products with others. In my classroom, students have created movie trailers to convey their understanding of mood or tone concepts in reading passages. I have also had students create movie presentations to share stories. Example available.

- **Powtoon.** PowToon is a website that allows teachers or students to create engaging animated videos and presentations. It is free to sign-up but offers paid premium membership plans for unlimited access to all content. These videos engage attention due to their short, simple, cartoon format. This website has pre-made templates that allow individuals to "drag and drop" content quickly. Individuals can add characters, images, voiceovers, and videos to their powtoons. In my classroom, I have used pre-made powtoons to teach reading concepts including the three types of irony: situational, dramatic, and verbal. These videos helped students visually recognize the difference between the concepts.
- **Prezi.** Prezi is a website that allows teachers or students to create and present engaging presentations. Authors are able to edit the theme colors, designer templates, and media within the presentation with a simple drag-and-drop feature. It also allows individuals to create charts from data. Prezi provides a zoom feature that allows you to emphasize key points and information within the presentation. These presentations can be viewed repeatedly once posted and provide a commenting option for feedback. It does require a paid subscription, but it offers a free trial. In my classroom, I do not use the paid subscription, so I mainly use this resource for pre-made presentations. I have used this to reinforce

reading concepts for topics like theme. Students really seem to enjoy the fun presentation format.

- **Skype.** Skype is a free Microsoft program that allows voice, text, and video communication. It can be used to connect students globally. Students can learn more about a topic or more about people from around the world. Educators can use Skype to incorporate virtual field trips, Skype lessons, collaborations, and guest speakers. In my classroom, I have used Skype to share a few guest speakers with my students. This provides relevant learning experiences and teaches students about local resources and individuals.
- **Story Creator.** This free iPad app allows students to create, save, and share stories in a simple way. Students can upload photos, text, or audio recordings on every page. They are able to personalize their stories by including their own voices or pictures and send their stories across devices. In my classroom, students have created stories on Story Creator and then presented them to the class through our document camera.
- **Story Kit.** This free iPad app allows students to create an electronic storybook, adding text and sounds to tell the story or add effects. Students can add scenes by drawing on the screen or taking a photograph of something. These scenes can be added, reordered, or deleted from the book. Students are able to edit the layout elements of the story, including text boxes, images, and sound clips, by freely dragging or pinching them to resize. All stories are private, and no account is needed to share the story. In my classroom, students have created stories and then presented them to the class through our document camera.

7. **About Me**. The About Me page gives visitors information on myself and my background. This helps them understand my credibility and experience in the field. I also provided a comment feature that allows teachers to submit questions, comments, concerns, or new resources to add. I will instantly receive email notifications once a message is sent to the website, ensuring quick responses and efficient communication.

> *My name is Rachel Dobrich. I graduated from the University of Illinois Urbana-Champaign with a Bachelor of Science degree in Speech-Language Pathology. Through some of my volunteering experiences, I developed a passion for teaching and decided to pursue my Master of Education degree in Elementary Education. I completed the yearlong post-baccalaureate program at the University of Alaska Fairbanks, becoming a certified elementary teacher.*
>
> *For my master's project, I wanted to research different ways to incorporate technology in the classroom. I believe all teachers would really benefit from a resource guide, helping make the curriculum more engaging for the students. I want to teach students how these resources can be used in their daily lives, not just when they are in the classroom. Currently, I am a 6th Grade Language Arts teacher, and I've focused my project on this subject area. I love my job, and I look forward to my future in the field of elementary education!*

In addition, this website includes some examples of how I have implemented these resources into my teaching. Several examples reflect recommendations or ideas from other teachers. The website format allowed me to easily add, change, or modify the website's elements and create a visually appealing and user-friendly final product. I am hoping to encourage and provide hope to

educators, emphasizing that they can feel confident in their technology use with practice. I am confident that this will inspire teachers to continue their search for professionally vetted and curated lists to build their technology libraries. For example, every year, there are "various sites that have been recognized by AASL Best Websites that have the ability to fit all levels of the SAMR model" (Jacobs-Israel & Moorefield-Lang, 2013, p.16). Continuous research, using similar credible sources, will add value to their instruction and their ability to engage students with technology.

Plans for Dissemination

To improve learning experiences for students, I wanted to use a platform that could easily be accessed by others. Therefore, I chose to create a website with my findings and descriptions. This website is available and can be opened by any individual with internet access, regardless of location. I recognize that this product will need to be updated or changed regularly in order to stay current and accurate. Therefore, I provided a comment section for educators to send concerns, comments, or ideas for additions.

To share this resource with other educators, I would like to post my website on commonly-used platforms, such as Teachers Pay Teachers or Pinterest. Educators frequently browse these websites for curriculum ideas, and this strategy will increase the likelihood of more people seeing and using my resource. In addition, I would like to share my findings with my building by teaching a brief class on my findings. This could possibly occur during one of our professional development days, ensuring that other educators benefit from my findings. I would also like to record this "class." Therefore, other teachers outside my building can access my explanations at any time and share the content with their colleagues. I hope that this website will inspire educators to build their technology repertoire. By collaborating with other educators and viewers of this website, I hope to help build confidence in our technology use and creation of authentic activities for our students.

Reflections on the Process/Dissemination

This project was conducted to create resources for educators in the elementary classroom. The website reflects research and resources that focus on implementation in 4th through 6th grade classrooms. However, these activities can be modified for higher or lower age levels. I shared this final website with numerous colleagues who provided contributions to my research, and I have received very positive feedback thus far. Some comments mentioned that this website has already provided them with new ideas for their classrooms. Others expressed that it was organized in an easy-to-understand way. Responses show that this website is very user-friendly and well-rounded. It allows teachers to determine if a program is appropriate for their classroom and assess how it can enhance their students' levels of thinking.

Before I began my research on this topic, I recognized that there were several potential issues. Technology requires a lot of time and repeated practice to master. I spent a significant amount of time working on this project, sometimes several hours on each program. However, I did not make a dent in evaluating all of the programs available. It was impossible to cover every program in existence, and I also was not able to cover every content topic in the English/Language Arts curriculum. My running list grew longer and longer as I communicated with new teachers or explored new websites. Discovery was not the problem. Instead, my main issue was finding the time to explore all of these websites fully in order to master them. I confidently mastered about 35 of my resources during the allotted project time. However, my running list still contains over 100 programs yet to be explored. Teachers are going to have this same issue as they embark on their technology journey. I am hoping that this website eliminates some of that time and encourages others to contribute to this website. If we collaborate and work

together to expand our technology understanding, we will continue to enhance our students' learning experiences.

As an educator, I continue to recognize the importance of self-reflection. I evaluated my own performance throughout completion of this project, and I confidently developed mastery of numerous technology programs through repetition and practice. This emphasizes the importance of proactively exploring new resources and attending available professional development opportunities. When using these resources in the classroom, teachers will need to determine how to improve their own technology use through trial and error. It is important to remember that things do not always run smoothly. Teachers should view challenges as learning opportunities and consider how to improve the component for next time. I also believe in the importance of feedback from others. I had other educators review my website, and their feedback enhanced my final product. Teachers should conduct the same routine in their classrooms by asking their students for feedback on technology tools. Students can be very honest in their feedback and indicate if the lesson was engaging for them or not. The students' reactions can guide teachers' future decisions in their lesson creations and give students more responsibility in their learning.

Overall, I really enjoyed completing this project, and I am proud of the final outcome. This website can be used to organize my own technology understanding and provide recommendations to other teachers. Teaching is a field that I am truly passionate about. I love my students, and I am willing to put unlimited amounts of time and effort in to help them succeed. I am hoping that my findings from this project enhance learning experiences for these individuals and inspire students to discover their own ambitions.

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Appendix A

Initial Evaluation Criteria

SAMR Model	Bloom's Taxonomy / Technology Program
Redefinition: allows for the creation of new tasks, previously inconceivable	**6) Create:** produce new or original work •
	5) Evaluate: justify a stand or decision •
Modification: allows for significant task redesign	**5) Evaluate:** justify a stand or a decision •
	4) Analyze: draw connections among ideas
	3) Apply: use information in new situations •
Augmentation: acts as a direct tool substitute, with functional improvement	**3) Apply:** use information in new situations •
	2) Understand: explain ideas or concepts •
Substitution: acts as a direct tool substitute, with no functional change	**1) Remember:** recall facts and basic concepts •

Developed by Rachel Dobrich
January 2018

Appendix B

Modified Evaluation Criteria

			Bloom's Taxonomy					
			Remember: exhibit memory of previously learned material by recalling facts, terms, basic concepts, and answers	**Understand:** demonstrate understanding of facts and ideas by organizing comparing, translating, interpreting, giving descriptions, and stating main ideas	**Apply:** solve problems to new situations by applying acquired knowledge, facts, techniques, and rules in a different way	**Analyze:** examine and break information into parts by identifying motives or causes; make inferences and find evidence to support generalizations	**Evaluate:** present and defend opinions by making judgments about information, validity of ideas, or quality of work based on a set of criteria	**Create:** compile information together in a different way by combining elements in a new pattern or proposing alternative solutions
		Technology Program						
SAMR Model	**Substitution:** acts as a direct tool substitute, with no functional change	▪						
	Augmentation: acts as a direct tool substitute, with functional improvement	▪						
	Modification: allows for significant task redesign	▪						
	Redefinition: allows for the creation of new tasks, previously inconceivable	▪						

Developed by Rachel Dobrich
August 2018

Appendix C

Bloom's Revised Taxonomy Action Verbs

The following image illustrates my framework used to evaluate the technology programs. The words highlighted in yellow indicate additions that I made to the original list.

	Bloom's Revised Taxonomy					
	Remember	**Understand**	**Apply**	**Analyze**	**Evaluate**	**Create**
Action Verb Demonstrated Through Technology Integration	Choose Define Find **Highlight** How Label List **Listen** Match Name Omit **Organize** **Practice** **Read** Recall **Record** Relate **Reproduce** **Review** Select Show Spell **Submit** Tell **View** What When Where Which Who Why	**Assess** Classify **Collaborate** Compare **Compete** Contrast **Define** Demonstrate **Differentiate** **Draw** Explain Extend **Highlight** Illustrate Infer Interpret **Observe** Outline **Record** **Reinforce** Relate Rephrase Show **Sketch** Summarize **Supplement** Translate	Apply Build Choose Construct **Contribute** Develop **Edit** Experiment with **Generate** Identify Interview Make use of Model Organize Plan **Respond** Select Solve Utilize	Analyze **Annotate** Assume **Brainstorm** Categorize Classify Compare Conclusion/**Conclude** Contrast Discover Dissect Distinguish Divide Examine **Explore** Function Inference Inspect List **Manipulate** **Mind Map** Motive **Reflect** Relationships Simplify Survey Take part in Test for Theme	Agree Appraise Assess Award Choose **Collaborate** **Communicate** Compare Conclude **Connect** Criteria Criticize Decide Deduct Defend Determine Disprove **Edit** Estimate Evaluate Explain **Facilitate** Importance Influence Interpret Judge Justify Mark Measure **Monitor** Opinion Perceive Prioritize Prove Rate Recommend Rule on Select **Supervise** Support Value	Adapt **Animate** Build Change Choose **Collect** Combine Compile Compose Construct Create Delete Design Develop Discuss Elaborate Estimate Formulate Happen Imagine Improve Invent Make up Maximize Minimize Modify **Network** Original Originate Plan Predict **Present** Propose **Publish** **Screencast** **Share** Solution Solve Suppose Test Theory **Video-Conference**

Based on: Anderson, L.W., & Krathwohl, D.R. (2001). A Taxonomy for Learning, Teaching, and Assessing, Abridged Edition. Boston, MA: Allyn and Bacon.
Developed by Rachel Dobrich
August 2018

Appendix D

Summarized Data Results

The following image illustrates an overview of how each program has been classified. Refer to Table D1, D2, D3, and D4 for a more detailed breakdown of each category, identifying key action verbs used in the classification process.

			Bloom's Taxonomy					
			Remember:	Understand:	Apply:	Analyze:	Evaluate:	Create:
		Technology Program						
SAMR Model	Substitution:	• Dictionary	X	X				
		• Google Docs	X	X			X	X
		• IXL	X	X				
		• Kahoot	X	X				
		• Pages	X	X			X	X
		• Plickers	X	X				
		• Quizlet	X	X				
		• Spelling City	X	X				
	Augmentation:	• BrainPop	X	X				
		• Google Classroom	X		X		X	X
		• Google Drive	X				X	X
		• Google Forms	X	X			X	
		• Google Slides			X		X	X
		• Keynote			X		X	X
		• I-nigma	X					
		• Newsela		X				
		• Notability	X	X		X		
		• Screencast-o-Matic		X				X
		• Sketchbook	X	X				
		• Socrative	X	X				
		• Trading Cards	X	X				X
		• YouTube	X	X				X
	Modification:	• Breakout EDU				X	X	
		• iPhoto		X	X			
		• Nearpod	X	X		X		
		• Popplet	X		X	X	X	X
	Redefinition:	• Book Writer		X			X	X
		• Diigo			X	X	X	X
		• Google Hangouts					X	X
		• iMovie					X	X
		• Powtoon	X	X				X
		• Prezi					X	X
		• Skype					X	X
		• Story Creator		X				X
		• Story Kit		X			X	X

Table D1

Substitution

Program	Blooms Taxonomy	Action Verbs
Dictionary	Remember, Understand	Find, Read, Define
Google Docs	Remember, Understand, Evaluate, Create	List, Show, Type, Explain, Outline, Collaborate, Edit, Compile
IXL	Remember, Understand	Practice, Recall, Review, Differentiate, Reinforce, Supplement
Kahoot	Remember, Understand	Choose, Recall, Review, Compete, Demonstrate
Pages	Remember, Understand, Evaluate, Create	List, Show, Type, Explain, Edit, Compile
Plickers	Remember, Understand	Recall, Review, Demonstrate
Quizlet	Remember, Understand	Choose, Practice, Recall, Review, Demonstrate, Collaborate, Compete
Spelling City	Remember, Understand	Practice, Review, Reinforce, Supplement

Table D2

Augmentation

Program	Blooms Taxonomy	Action Verbs
BrainPop	Remember, Understand	Listen, Relate, View, Highlight, Compare, Extend, Reinforce, Supplement
Google Classroom	Remember, Apply, Evaluate, Create	Organize, Generate, Respond, Contribute, Communicate, Connect, Facilitate, Monitor, Supervise, Share
Google Drive	Remember, Evaluate, Create	Organize, Save, Collaborate, Connect, Compile, Share
Google Forms	Remember, Understand, Evaluate	Submit, Recall, Assess, Poll, Grade
Google Slides	Apply, Evaluate, Create	Organize, Collaborate, Communicate, Edit, Create, Present, Share
Keynote	Apply, Evaluate, Create	Organize, Edit, Create, Present, Share
I-nigma	Remember	Connect, Scan
Newsela	Understand	Differentiate, Extend, Relate, Supplement
Notability	Remember, Understand, Analyze	Organize, List, Recall, Explain, Illustrate, Show, Record, Reflect
Screencast-o-Matic	Understand, Create	Demonstrate, Explain, Record, Create, Present
Sketchbook	Remember, Understand	Label, Draw, Illustrate, Interpret
Socrative	Remember, Understand	Recall, Review, Practice, Assess, Compete, Poll
Trading Cards	Remember, Understand, Create	Recall, Demonstrate, Show, Summarize, Create
YouTube	Remember, Understand, Create	Watch, Demonstrate, Record, Create, Present, Publish

Table D3

Modification

Program	Blooms Taxonomy	Action Verbs
Breakout EDU	Analyze, Evaluate	Manipulate, Problem-Solve, Collaborate, Communicate
iPhoto	Understand, Apply	Demonstrate, Construct, Edit, Organize
Nearpod	Remember, Understand, Analyze	Practice, Review, Demonstrate, Explain, Observe, Discover, Explore
Popplet	Recall, Review, Practice, Assess, Compete, Poll	List, Apply, Construct, Organize, Brainstorm, Categorize, Classify, Compare, Discover Relationships, Mind Map, Deduct, Plan

Table D4

Redefinition

Program	Blooms Taxonomy	Action Verbs
Book Writer	Understand, Evaluate, Create	Demonstrate, Explain, Record, Edit, Compile, Create, Publish
Diigo	Apply, Analyze, Evaluate, Create	Organize, Conclude, Inspect, Simplify, Assess, Compare, Evaluate, Interpret, Build, Combine, Compile
Google Hangouts	Evaluate, Create	Collaborate, Network, Present, Video-Conference
iMovie	Evaluate, Create	Edit, Collect, Compile, Develop, Present, Publish
Powtoon	Remember, Understand, Create	Watch, Reinforce, Supplement, Animate, Compile, Create, Present
Prezi	Evaluate, Create	Edit, Compile, Create, Present
Skype	Evaluate, Create	Collaborate, Network, Present, Video-Conference
Story Creator	Understand, Create	Elaborate, Explain, Record, Compile, Create, Present
Story Kit	Understand, Evaluate, Create	Draw, Explain, Record, Tell, Edit, Create, Share